



# PARTIAL ROOFING REPLACEMENT FOR THE READING CITY HALL

FOR:

## THE CITY OF READING

BERKS COUNTY, CITY OF READING, PENNSYLVANIA

FEBRUARY 2022



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**SECTION 02 41 00**  
**SELECTIVE DEMOLITION****PART 1 GENERAL****1.1 DESCRIPTION**

- A. Work included:
  - 1. Complete demolition of portions of existing building(s) indicated or as required in preparation for alterations and installation of new roofing system.
  - 2. Take all necessary precautions to insure against damage to existing work to remain in place, to be reused, or to remain the property of the Owner, and any damage to such work shall be repaired or replaced as approved at no additional cost to the Owner.
- B. Related Work specified elsewhere:

**1.2 SUBMITTALS**

- A. Obtain, pay for, and submit all permits required for execution of demolition work including the following:
  - 1. Permits and notices authorizing building demolition.
  - 2. Permit for transport and disposal of debris.
  - 3. Demolition procedures and operation sequence.
- B. Submit demolition procedures and operation sequence.
- C. Permits for Disposal of Debris:
  - 1. Arrange for legal disposal of debris and obtain written agreements with the owners of the property where the debris shall be deposited.
  - 2. Provide a certification of disposal (use form attached at the end of this section) that an agreement releasing the Owner from all responsibility in connection with the disposal of the debris was executed.

**1.3 COORDINATION**

- A. Utility Removal: Arrange with utility companies for changes in their equipment, and capping of pipes and wiring as required.
- B. Schedule disruption of utilities or facilities with the Owner a minimum of 48 hours in advance of shut-down.
- C. Maintaining Traffic:
  - 1. Do not close or obstruct public streets, sidewalks, alleys or passageways without permission from authorities having jurisdiction.
  - 2. If required by authorities, provide alternate routes around closed or obstructed traffic ways.

**1.4 JOB CONDITIONS**

- A. Existing Conditions: Survey existing work and examine the Contract Documents to determine extent of demolition work.
- B. Protection:
  - 1. Includes but not limited to erecting barriers, dust partitions, fences, guard rails, enclosures, chutes and shoring as required to protect structures and utilities remaining intact.

2. Protect any trees, plants, grass and other landscaping designated to remain from damage. Replace any trees, plants or other landscaping materials designated to remain that are damaged during the work under this Contract.
3. Protect the interior of the building and all materials and equipment from the weather at all times. Replace materials and equipment damaged by weather at no additional cost to the Owner.
4. Take necessary precautions to insure against damage to existing materials or equipment to remain in place, to be reused, or to remain the property of the Owner. Repair or replace damaged materials and equipment at no additional cost to the Owner.

**PART 2 PRODUCTS (NOT USED)****PART 3 EXECUTION****3.1 PREPARATION**

- A. Preparation:
1. Verify the extent of demolition work to be performed with the Professional.
  2. Arrange for and verify termination of utility services, including removing meters and capping lines.
  3. Remove items scheduled to be salvaged for Owner and place in designated storage area.

**3.2 DEMOLITION**

- A. Demolition:
1. Demolish structures in accordance with demolition procedures submitted.
  2. Maintain area outside in as clean condition as possible during progress of demolition work.
  3. Limit dust to lowest practicable level.
  4. Do not use water to extent of causing flooding, contaminated runoff or icing.
  5. Repair damage to adjacent construction or structures.
  6. Remove all clamps, brackets, supports, hangers, conduits, controls, wire, etc. associated with equipment/pipe indicated to be removed and patch all areas to match adjacent areas.
- B. Owner has the right to salvage any materials or equipment including but not limited to subsection 3.4.

**3.3 DISPOSAL**

- A. Disposal:
1. Remove demolition debris to designated disposal area promptly.
  2. Do not store or burn materials on-site.
  3. Disposal areas shall be approved by Department of Environmental Protection and any other authorities having jurisdiction.

**END OF SECTION**

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**SECTION 05 31 00**  
**STEEL DECKING****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Roof deck.
- B. Bearing plates and angles.

**1.2 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel; 2013.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- D. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- E. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2008.
- F. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- G. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems; ICC Evaluation Service, Inc; 2010 (R2013).
- H. ICC-ES AC70 - Acceptance Criteria for Fasteners Power Driven into Concrete, Steel and Masonry Elements; ICC Evaluation Service, Inc; 2013.
- I. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.
- J. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

**1.3 SUBMITTALS**

- A. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
- B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- C. Submit manufacturer's installation instructions.
- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

**1.4 QUALITY ASSURANCE**

- A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Commonwealth of Pennsylvania.
- B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Cut plastic wrap to encourage ventilation.

- B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

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## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Steel Deck:
1. Canam Steel Corporation: [www.canam-steeljoists.ws](http://www.canam-steeljoists.ws).
  2. Cordeck, Inc: [www.cordeck.com](http://www.cordeck.com).
  3. Nucor-Vulcraft Group: [www.vulcraft.com](http://www.vulcraft.com).

### **2.2 STEEL DECK**

- A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
1. Calculate to structural working stress design and structural properties specified.
  2. Maximum Vertical Deflection of Roof Deck: 1/240 of span.
- B. Roof Deck: Non-composite type, fluted steel sheet:
1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
  2. Structural Properties:
    - a. Span Design: Double.
  3. Minimum Base Metal Thickness: 20 gage, 0.0359 inch.
  4. Nominal Height: Match existing.
  5. Profile: Match existing..

### **2.3 ACCESSORY MATERIALS**

- A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.
- B. Welding Materials: AWS D1.1/D1.1M.
- C. Fasteners: Galvanized hardened steel, self tapping.
- D. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.
1. Design Requirements: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.
  2. Material: Steel; ASTM A510/A510M, Grade 1077.
- E. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
1. Design Requirements for Sidelap Connections: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM)SDI design method for roof deck and floor deck applications and ICC-ES AC43.
- F. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- H. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.

### **2.4 FABRICATED DECK ACCESSORIES**

- A. Roof Sump Pans: Formed sheet steel, 14 gage, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.

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**PART 3 EXECUTION****3.1 EXAMINATION**

- A. Verify existing conditions prior to beginning work.

**3.2 INSTALLATION**

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On concrete and masonry surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 1-1/2 inch bearing.
- D. At cellular deck intended for electrical raceways level and align deck within 1/8 inch horizontally and vertically. Butt ends, allow for maximum 1/8 inch gap. Install sheet steel covers over gaps wider than 1/8 inch. Tape and seal joints watertight.
- E. Clinch lock seam side laps.
- F. At mechanically fastened male/female side laps fasten at 24 inches on center maximum.
- G. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.
- H. At welded male/female side laps weld at 18 inches on center maximum.
- I. Weld deck in accordance with AWS D1.3/D1.3M.
- J. At deck openings from 6 inches to 18 inches in size, provide 2 by 2 by 1/4 inch steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.
- K. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- L. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.
- M. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- N. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

**END OF SECTION**



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**SECTION 05 50 00**  
**MISCELLANEOUS METALS****PART 1 GENERAL****1.1 DESCRIPTION**

- A. Scope:
1. Furnish labor, materials, tools, equipment, services, supervision required to complete miscellaneous metalwork including all incidental and complementary work shown, specified, or necessary to complete work as indicated.

**1.2 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Section 09 90 00 - Painting and Coating: Painting of existing roof ladders and hoods where indicated on drawings.

**1.3 QUALITY ASSURANCE**

- A. Standards:
1. American Society for Testing and Materials (ASTM):
    - a. Carbon Structural Steel
    - b. Pipe Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
    - c. Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
    - d. Zinc Coating (Hot-Dip) on Iron and Steel Hardware
    - e. Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
    - f. Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
    - g. Steel, Sheet and Strip, Alloy, Hot-Rolled and Cold-Rolled,
      - 1) Drawing Quality
    - h. Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements
    - i. Commercial Steel (CS) Sheet, Carbon (0.15 Maximum Percent) Cold-Rolled, High Strength Low Alloy
  2. American Institute of Steel Construction (AISC)
  3. American Welding Society (AWS)
  4. OSHA Standards
  5. Steel Structures Painting Council (SSPC)
- B. Welder, Welding Operator and Tacker Qualifications: Each welder, welding operator and tacker shall be qualified in accordance with the applicable requirements of AWS D1.1.

**1.4 SUBMITTALS**

- A. Shop Drawings (Miscellaneous Steel Fabrications and Anchor Bolts):
1. Submit complete, detailed shop and erection drawings of all work for approval before starting fabrication and installation of materials.
  2. Show details of construction and placement including hardware, fittings and fastenings, anchorages, types and gauges of metals being used.
- B. Welder Qualifications: Submit evidence of qualifications for welders, welding operators and tackers.

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**1.5 JOB CONDITIONS**

- A. Field paint exposed steel in addition to shop coats and mill finishes.

**1.6 PRODUCT DELIVERY, HANDLING AND STORAGE**

- A. Deliver all materials in good condition. Store in dry place, off ground; keep dry at all times. Handle materials to prevent damage to product or structure.

**PART 2 PRODUCTS****2.1 MATERIALS**

- A. General: Metals free from defects impairing strength, durability and appearance; best commercial quality for purposes specified, structural properties to safely withstand strains and stresses to which subjected.
- B. Steel Materials:
1. Structural Steel: ASTM A283 or A36, as applicable.
  2. Cold Finished Steel: Mild steel, rolled, drawn, ASTM A568.
  3. Steel Pipe: Galvanized, Schedule 40 or Schedule 80, ASTM A53 as indicated on the Contract Drawings.
  4. Steel Bolts, Nuts, Washers: ASTM A307, Grade A, General Use and Grade B, Flanges galvanized in accordance with ASTM A153.
  5. High Tension Bolts: ASTM A325 Type 3 for corrosive locations.

**2.2 FABRICATION**

- A. General:
1. Form and finish metalwork to shape and size with sharp angles and lines.
  2. Metalwork that becomes bent by shearing or punching may be straightened and used if approved by the Architect.
  3. Grind exposed edges of work smooth; construct joints exposed to weather to exclude water.
- B. Hardware:
1. Countersink metalwork to receive the required hardware and to provide the proper bevels and clearances.
  2. Provide welded backup plates for mounting hardware; drill or punch holes for bolts and screws; conceal fastenings wherever practicable.
  3. Provide brackets, lugs, and similar accessories required for installation as a part of the metal item.
- C. Shop and Field Welding:
1. In accordance with recommendations of American Welding Society (AWS) Standard D1.
  2. Welds solid and homogeneously a part of metals joined for full area indicated or necessary to develop required strength of joint.
  3. Welds free from pits or incorporated slag or scale; surfaces of welds smooth and regular.
- D. Workmanship Class 1:
1. Exposed Surfaces: Sandblast surfaces smooth with pits, mill marks, nicks and scratches filled or ground off. Defects shall not show when painted.
  2. Welds: Conceal welds where possible. Where exposed, grind welds to small radius with uniform sized cove. When painted, welds shall be undetectable.
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3. Bolts: Use only flat head countersunk bolts in exposed locations.
  4. Straightness: Distortions visible to the eye will be rejected.
  5. Joints: Fit joints to hairline finish.
- E. Workmanship Class 2:
1. Exposed Surfaces: Moderate irregularities not visible at 30' may remain. Mill marks may remain.
  2. Welds: Grind welds to small radius with uniform sized cove.
  3. Bolts: Use only flat or oval head countersunk bolts where exposed to view.
  4. Straightness: Minor distortions will be permitted.
  5. Joints: Provide maximum gap of 1/16".
- F. Workmanship Class 3:
1. Exposed Surfaces: No improvement from mill finish required except preparation for galvanizing or priming.
  2. Welds: Grinding not required.
  3. Bolts: Exposed bolts permitted.

### **2.3 EXISTING VERTICAL LADDERS AND HOODS**

- A. Field Finish: See Section 09 90 00 - Painting and Coating.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Clean dirt, debris, oil, grease and other foreign substances from surfaces to receive metal items.
- B. Where aluminum components contact concrete or lime mortar, paint surfaces with alkaline-resistant coatings such as heavy-bodied bituminous paint.
- C. Dissimilar Materials: Isolate dissimilar materials to prevent electrolytic actions by neoprene gaskets, asphaltum paint or other materials.

### **3.2 WORKMANSHIP**

- A. General: Refer to the Drawings for items required; items require the following workmanship classes and finishes.
1. Steel Items Subject to Contact with Moisture: Galvanized finish.
- B. Details and connections shall be carefully made and fitted, with special care exercised to produce a thoroughly neat appearance; make pieces in accordance with detail shop drawings; members shall be true to length so assembling may be done without fillers, except where required by details; allow no projecting edges or corners where different members are assembled; do mitering and blocking precisely.
- C. Set built-up parts true to line and without sharp bends, twists or kinks.
- D. Provide caulking as required to set, seal and secure metal items; refer to Section 07 90 00 - Caulking and Sealant Work.

### **3.3 BURNING AND WELDING**

- A. Burning: Burning of holes in field shall not be permitted without consent; if consent is given, burned members shall be finished to an appearance equal to sheared finish; burning shapes to length with standard flame-cutting machine will be permitted.

- B. Perform both shop and field welding in accordance with recommendations of American Welding Society. Welds shall be solid and homogeneously a part of metals joined, free from pits or incorporated slag or scale; surfaces of welds shall be smooth and regular, of full area indicated or necessary to develop required strength of joint.

### **3.4 INSTALLATION**

- A. Erect work to lines and levels, plumb and true, in correct relation to adjoining work; secure parts in rigid, durable manner. Provide concealed connections wherever possible.
- B. Provide anchors and inserts in sufficient number for proper fastening of metal items; embed anchors in concrete so as to accurately align metalwork at proper level.
- C. Where necessary to secure miscellaneous metalwork to structure by means of expansion bolts, cinch anchors and similar connections, do work of laying out, installing such connections, installing miscellaneous work, and bolting up.
- D. Throughout work, provide anchors, inserts wherever possible for building adjoining work; where lugs are shown or specified for building into adjoining masonry, erect parts having lugs before masonry is built; elsewhere, bring work to building in as large pieces as practicable, attach to anchors or inserts during erection.
- E. Connections made to sleeve inserts, except where noted removable, install members into sleeves, wedged tight with metal wedges; pour surrounding space full of expanding grout; caulk to finish flush with adjoining surface.

### **3.5 CONNECTIONS**

- A. Unless otherwise specified, all shop connections shall be welded or riveted; framing connections made in field shall be made with high tension steel bolts; other connections may be made by any of the above methods, or with standard strength bolts.
- B. All connections shall develop strength required for members involved; in no case less than AISC standard.
- C. Provide lugs, clips, connections, rivets, bolts, necessary for complete fabrication, erection; bolts remaining in finished, exposed work shall be hexagon head bolts with hexagon nuts; bolts shall be of proper length to permit full thread in nut, but not project more than 1/4" beyond face of nut. Rivets, both shop and field, power driven; shall provide 100 lbs. per sq. in. at hammer minimum.

### **3.6 FIELD PAINTING**

- A. Where shop coat is abraded or burned by welding, clean and touch-up.
- B. Repair surfaces of zinc coating that have been damaged during delivery, storage or installation by thoroughly wire brushing the damaged areas and removing all loose and cracked zinc coating, then paint the cleaned areas with 2 coats of zinc-dust, zinc-oxide primer; touch-up zinc-dust coated surfaces with the same material as the coating.
- C. Field paint in accordance with the requirements of Section 09 90 00.

### **3.7 CLEAN UP**

- A. All work shall be left in clean condition, and all debris and rubbish cleaned up and removed from site by Contractor.

**END OF SECTION**

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**SECTION 06 10 00**  
**ROUGH CARPENTRY****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Non-structural dimension lumber framing.
- B. Roofing nailers.
- C. Preservative treated wood materials.

**1.2 RELATED REQUIREMENTS**

- A. Section 07 53 00 - Elastomeric Membrane Roofing.

**1.3 REFERENCE STANDARDS**

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.
- C. PS 20 - American Softwood Lumber Standard; 2010.
- D. SPIB (GR) - Grading Rules; 2014.

**1.4 SUBMITTALS**

- A. Product Data: Provide technical data on wood preservative materials.
- B. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

**PART 2 PRODUCTS****2.1 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
  - 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
  - 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee ([www.alsc.org](http://www.alsc.org)) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
- B. Lumber fabricated from old growth timber is not permitted.

**2.2 DIMENSION LUMBER FOR CONCEALED APPLICATIONS**

- A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.

**2.3 ACCESSORIES**

- A. Fasteners and Anchors:
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1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
- B. Water-Resistive Barrier: No. 15 asphalt felt.

## **2.4 FACTORY WOOD TREATMENT**

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
  1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Preservative Treatment:
  1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
    - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
    - b. Treat lumber in contact with roofing, flashing, or waterproofing.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION - GENERAL**

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

### **3.2 ROOF-RELATED CARPENTRY**

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- B. Provide wood curb at all roof openings except where specifically indicated otherwise. Form corners by alternating lapping side members.

### **3.3 TOLERANCES**

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

### **3.4 CLEANING**

- A. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- B. Prevent sawdust and wood shavings from entering the storm drainage system.

**END OF SECTION**

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**SECTION 07 53 00**  
**ELASTOMERIC MEMBRANE ROOFING**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Elastomeric roofing membrane, fully adhered application with mechanically fastened cover board as indicated on drawings.
- B. Tapered insulation used for crickets.
- C. Insulation for deck infills.
- D. Roof edge metals.
- E. Flashings.
- F. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

**1.2 RELATED REQUIREMENTS**

- A. Section 05 3100 - Steel Decking:
- B. Section 06 10 00 - Rough Carpentry: Wood nailers and curbs.
- C. Section 07 62 00 - Sheet Metal Flashing and Trim.
- D. Section 07 92 00 - Joint Sealant.
- E. Section 22 10 06 - Plumbing Piping Specialties: Roof drains.
- F. Section 22 14 26 - Retrofit Roof Drains.

**1.3 REFERENCE STANDARDS**

- A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.
- B. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2013.
- C. ANSI/SPRI FX-1: Standard Field Test Procedure for Determining the Withdrawl Resistance of Roofing Fasteners; 2016.
- D. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.
- E. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with installation of associated counterflashings installed under other sections.
- B. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

**1.5 SUBMITTALS**

- A. Product Data: Provide data indicating membrane materials, flashing materials, insulation, and fasteners.
- B. Shop Drawings: Indicate joint or termination detail conditions and conditions of interface with other materials.
- C. Test Reports: Provide test reports from testing of existing gypsum roof deck for pull tests as per ANSI/SPRI FX-1: Standard Field Test Procedure for Determining the Withdrawl Resistance of Roofing

Fasteners; 2016 for installation of mechanically fastened cover board where existing roof decks are identified as gypsum roof decks.

- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- F. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### **1.6 QUALITY ASSURANCE**

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience, and approved by manufacturer.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.

#### **1.8 FIELD CONDITIONS**

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 120 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

#### **1.9 WARRANTY**

- A. Provide 30 year manufacturer's material and labor warranty to cover failure to prevent penetration of water.
  - 1. Provide 30 year installers warranty to cover failure to prevent penetration of water.

### **PART 2 PRODUCTS**

#### **2.1 EPDM MEMBRANE MATERIALS:**

- A. Basis of Design Manufacturer: Carlisle Syntec Systems, Inc; Sure-Seal EPDM with enhanced details: [www.carlisle-syntec.com](http://www.carlisle-syntec.com).
- B. Acceptable Manufacturers: Subject to compliance with requirements, provide one of the following adhered EPDM roofing systems, with indicated and necessary enhancements:
  - 1. RubberGard®; Firestone Building Products Co.
  - 2. GenFlex; GenFlex Roofing Systems, GenCorp Polymer Products.



3. JM EPDM NR 90 MIL; Johns Manville Co.
4. Versigard™; Versico, Inc.

## **2.2 ROOFING**

- A. Elastomeric Membrane Roofing: One ply membrane, fully adhered, over cover board.
- B. Acceptable Insulation Types - Constant Thickness Application: Any type that meets requirements and is approved by membrane manufacturer for application.
- C. Acceptable Insulation Types - Tapered Application: Any type that meets requirements and is approved by membrane manufacturer for application.

## **2.3 ROOFING MEMBRANE AND ASSOCIATED MATERIALS**

- A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); Type I non-reinforced; complying with minimum properties of ASTM D4637.
  1. Thickness: 0.090 inch.
  2. Color: Black.
  3. Seaming Materials: As recommended by membrane manufacturer.
  4. Membrane Adhesive: As recommended by and approved by membrane manufacturer.
  5. Flexible Flashing Material: Same material as membrane.
- B. Insulation Cover Board: Basis of Design Manufacturer: Carlisle Syntec Systems, Inc; SecurShield HD Plus Polyiso, 1/2 inch thick, glass-mat faced, high density polyiso insulation:
  1. Type II, Class 4, Grade 1 meeting ASTM C1289.
  2. Or equal: As approved by roofing membrane manufacturer.

## **2.4 INSULATION**

- A. Polyisocyanurate Board Insulation: Basis of Design Manufacturer: Carlisle Syntec Systems, Inc; SecurShield; rigid cellular foam, complying with ASTM C1289, Type II, Class 2, cellulose felt or glass fiber mat both faces; Grade 1 and with the following characteristics:
  1. Compressive Strength: 25 psi.
  2. Board Size: 48 by 48 inch or 48 by 96 inch.
  3. Tapered Board for Crickets: Slope as indicated; minimum thickness, 1/2 inch; fabricate of fewest layers possible.
  4. Manufacturer: As approved by roofing membrane manufacturer.

## **2.5 ACCESSORIES**

- A. Prefabricated Roofing Expansion Joint Flashing: Sheet butyl over closed-cell foam backing seamed to galvanized steel flanges.
- B. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- C. Cant and Edge Strips: Wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle.
- D. Termination Bars: Stainless steel surface mounted type with flanged top for caulking as approved by roofing manufacturer.
- E. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.

- F. Insulation and Cover Board Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
- G. Membrane Adhesive: As recommended by membrane manufacturer.
- H. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- I. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- J. Insulation Adhesive: As recommended by insulation manufacturer.
- K. Sealants: As recommended by membrane manufacturer.
- L. Mechanical Fasteners for Insulation Cover Board: As recommended by insulation cover board and roofing manufacturers for type of roof deck indicated on the drawings and pull out resistance required to meet warranty specified.
- M. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
  - 1. Composition: Asphaltic with mineral granule surface or Roofing membrane manufacturer's standard.
  - 2. Locations: As indicated on drawings.

## **2.6 METAL COPING**

- A. Basis of Design: SecurEdge 200 Coping by Carlisle Syntec; [www.carlisle-syntec.com](http://www.carlisle-syntec.com) or approved equal by Carlisle Syntec as required to achieve warranty specified.
  - 1. Material: .050 inch thick aluminum
  - 2. Concealed splice plates: 8" wide. Finish to match finish of coping cap with factory applied dual non-curing sealant strips.
  - 3. Anchor/Support Cleat: 20 ga. prepunched galvanized cleat with stainless steel spring mechanically locked to cleat normally 12" (305 mm) wide @ 6'-0" (1525 mm) on center. Mechanically fastened as indicated and detailed.
  - 4. Fasteners: #12 x 1-5/8" corrosion resistant fasteners provided with drivers. No exposed fasteners shall be permitted. Fasteners shall be electrolytically compatible.
  - 5. Size and profile: To match existing or as indicated on drawings.
  - 6. Corner Fabrication: Corners to be mitered and factory welded.
  - 7. Finish: Kynar 500 finish system from manufacturer's standard color to match existing as close as possible and approved by Owner.

## **2.7 METAL FASCIA**

- A. Basis of Design: SecurEdge 200 Fascia by Carlisle Syntec; [www.carlisle-syntec.com](http://www.carlisle-syntec.com) or approved equal by Carlisle Syntec as required to provide warranty.
  - 1. Material: .050 inch thick aluminum
  - 2. Concealed splice plates: 8" wide. Finish to match finish of coping cap with factory applied dual non-curing sealant strips.
  - 3. Water Dam/Support Cleat: Continuous 24 ga. prepunched galvanized cleat mechanically fastened as indicated and detailed.
  - 4. Fasteners: #12 x 1-5/8" corrosion resistant fasteners provided with drivers. No exposed fasteners shall be permitted. Fasteners shall be electrolytically compatible.
  - 5. Size and profile: As required to match existing roof edge condition.

6. Fascia Extenders: As required to match existing conditions. Material thickness and finish to match fascia.
7. Scuppers: Thru-face fascia scuppers in locations to match existing and as indicated elsewhere on drawings. Material thickness and finish to match fascia.
8. Finish: Kynar 500 finish system from manufacturer's standard color to match existing as close as possible and approved by Owner. Separate color selection per school.

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**PART 3 EXECUTION****3.1 EXAMINATION**

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

**3.2 INSULATION - UNDER MEMBRANE**

- A. Attachment of Insulation:
  1. Base Layer for Mechanically Fastened for roof locations as indicated on drawings: Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
  2. Additional Layers for Mechanically Fastened Method: Mechanically fasten each subsequent layer of insulation to deck in accordance with roofing manufacturer's instructions.
  3. Additional Layers for Fully Adhered Method: Embed each subsequent layer of insulation in full bed of adhesive in accordance with roofing and insulation manufacturers' instructions.
  4. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
  5. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
  6. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
  7. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.
  8. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 24 inches.
  9. Do not apply more insulation than can be covered with membrane in same day.

**3.3 COVER BOARD INSTALLATION**

- A. Mechanically fasten cover board to roof deck where indicated on drawings, in accordance with Factory Mutual recommendations and roofing manufacturer's instructions.

**3.4 MEMBRANE APPLICATION**

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.

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- C. Fully Adhered Application: Apply adhesive to substrate at rate required by membrane manufacturer. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
  - D. At intersections with vertical surfaces:
    - 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
    - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
    - 3. Around roof penetrations, seal flanges and flashings with flexible flashing.
    - 4. Install roofing expansion joints where indicated. Make joints watertight.
      - a. Install prefabricated joint components in accordance with manufacturer's instructions.
    - 5. Coordinate installation of roof drains and sumps and related flashings.

### **3.5 FIELD QUALITY CONTROL**

- A. Require site attendance of roofing material manufacturers daily during installation of the Work.

### **3.6 CLEANING**

- A. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- B. Repair or replace defaced or damaged finishes caused by work of this section.

### **3.7 PROTECTION**

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

**END OF SECTION**

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**SECTION 07 62 00**  
**SHEET METAL FLASHING AND TRIM**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.
- B. Sealants for joints within sheet metal fabrications.

**1.2 RELATED REQUIREMENTS**

- A. Section 07 53 00 - Elastomeric Membrane Roofing.
- B. Section 07 92 00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

**1.3 REFERENCE STANDARDS**

- A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- B. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- C. CDA A4050 - Copper in Architecture - Handbook; current edition.
- D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.

**1.5 SUBMITTALS**

- A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

**1.6 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

**1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
  - 1. Prevent contact with materials that could cause discoloration or staining.

**PART 2 PRODUCTS**

**2.1 SHEET MATERIAL**

- A. Basis of Design: Fry Reglet - MA Masonry Reglet and counterflashing or comparable product meeting project requirements as approved by Architect.

**2.2 ACCESSORIES**

- A. Fasteners: Stainless steel, with soft neoprene washers.
- B. Primer: Zinc chromate type.
- C. Protective Backing Paint: Zinc molybdate alkyl.

- D. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
- E. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.

## **2.3 FABRICATION**

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

## **2.4 GUTTER AND DOWNSPOUT FABRICATION**

- A. Gutters: SMACNA (ASMM), Rectangular profile.
- B. Downspouts: Rectangular profile.
- C. Gutters and Downspouts: Sizes indicated.
- D. Seal metal joints.

## **2.5 ACCESSORIES**

- 1. Fasteners: Stainless steel, with soft neoprene washers.
- 2. Primer: Zinc chromate type.
- 3. Concealed Sealants: Non-curing butyl sealant.
- 4. Plastic Cement: ASTM D4586/D4586M, Type I.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify roofing termination and base flashings are in place, sealed, and secure.

### **3.2 PREPARATION**

- A. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

### **3.3 INSTALLATION**

- A. Saw cut existing mortar joint to depth required by reglet manufacturer.
- B. Insert flashings into reglets to form tight fit.
- C. Secure flashings in place using concealed fasteners.
- D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- E. Seal metal joints watertight.
- F. Repoint mortar joint once counterflashing is installed. Wipe counterflashing clean of excess mortar.
- G. Secure gutters and downspouts in place using concealed fasteners.
- H. Set splash [] under downspouts.

**3.4    SCHEDULE**

- A.    Sheet Metal Roof Expansion Joint Covers, and Roof-to-Wall Joint Covers:
- B.    Counterflashings at Roofing Terminations (over roofing base flashings):
- C.    Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:

**END OF SECTION**

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**SECTION 07 92 00****JOINT SEALANTS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Nonsag gunnable joint sealants.
- B. Joint backings and accessories.

**1.2 RELATED REQUIREMENTS**

- A. Section 07 53 00 - Elastomeric Membrane Roofing: Sealants required in conjunction with roofing system.
- B. Section 07 62 00 - Sheet Metal Flashing and Trim.

**1.3 REFERENCE STANDARDS**

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2006 (Reapproved 2011).
- B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015.
- C. ASTM C834 - Standard Specification for Latex Sealants; 2010.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- E. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2000 (Reapproved 2011).
- F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- G. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).
- H. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2010.
- I. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).
- J. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).
- K. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).

**1.4 SUBMITTALS**

- A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
  - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
  - 2. List of backing materials approved for use with the specific product.
  - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
  - 4. Substrates the product should not be used on.
  - 5. Substrates for which use of primer is required.
  - 6. Sample product warranty.
  - 7. Certification by manufacturer indicating that product complies with specification requirements.



- B. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- D. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

### **1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.
- C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
  - 1. Adhesion Testing: In accordance with ASTM C794.
  - 2. Compatibility Testing: In accordance with ASTM C1087.
  - 3. Allow sufficient time for testing to avoid delaying the work.
  - 4. Deliver to manufacturer sufficient samples for testing.
  - 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
  - 6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

### **1.6 WARRANTY**

- A. Correct defective work within a five year period after Date of Substantial Completion.
- B. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Nonsag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
  - 1. BASF Construction Chemicals-Building Systems: [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com).
  - 2. Dow Corning Corporation: [www.dowcorning.com/construction](http://www.dowcorning.com/construction).
  - 3. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
  - 4. Sika Corporation: [www.usa-sika.com](http://www.usa-sika.com).
  - 5. R. Meadows, Inc: [www.wrmeadows.com](http://www.wrmeadows.com).

### **2.2 JOINT SEALANT APPLICATIONS**

- A. Scope:
  - 1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
    - a. Wall expansion and control joints.
    - b. Joints between door, window, and other frames and adjacent construction.
    - c. Joints between different exposed materials.

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- d. Openings below ledge angles in masonry.
  - e. Other joints indicated below.
  - 2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
    - a. Joints between door, window, and other frames and adjacent construction.
    - b. Other joints indicated below.
  - 3. Do not seal the following types of joints.
    - a. Intentional weepholes in masonry.
    - b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
    - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
    - d. Joints where installation of sealant is specified in another section.
    - e. Joints between suspended panel ceilings/grid and walls.
  - B. Exterior Joints: Use nonsag non-staining silicone sealant, unless otherwise indicated.
    - 1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
    - 2. Lap Joints between Manufactured Metal Panels: Butyl rubber, non-curing.
    - 3. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.
  - C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
    - 1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
    - 2. Wall and Ceiling Joints in Wet Areas: Nonsag polyurethane sealant for continuous liquid immersion.
    - 3. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.

### **2.3 JOINT SEALANTS - GENERAL**

- A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in South Coast Air Quality Management District (SCAQMD); Rule 1168.

### **2.4 NONSAG JOINT SEALANTS**

- A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
  - 1. Movement Capability: Plus and minus 50 percent, minimum.
  - 2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
  - 3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
  - 4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
  - 5. Color: To be selected by Professional from manufacturer's standard range.
  - 6. Cure Type: Single-component, neutral moisture curing.
  - 7. Service Temperature Range: Minus 65 to 180 degrees F.
  - 8. Products:
    - a. Dow Corning Corporation; 756 SMS Building Sealant: [www.dowcorning.com/construction](http://www.dowcorning.com/construction).
    - b. Pecora Corporation; 890NST Ultra Low Modulus Architectural Silicone Sealant - Class 100: [www.pecora.com](http://www.pecora.com).

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- c. Sika Corporation; Sikasil WS-290: [www.usa-sika.com](http://www.usa-sika.com).
  - B. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
    - 1. Movement Capability: Plus and minus 25 percent, minimum.
    - 2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
    - 3. Color: To be selected by Professional from manufacturer's standard range.
    - 4. Cure Type: Single-component, neutral moisture curing
    - 5. Service Temperature Range: Minus 65 to 180 degrees F.
    - 6. Products:
      - a. Dow Corning Corporation; 758 Silicone Weather Barrier Sealant: [www.dowcorning.com/construction](http://www.dowcorning.com/construction).
      - b. Pecora Corporation; Pecora AVB Silicone: [www.pecora.com](http://www.pecora.com).
      - c. Sika Corporation; Sikasil GP: [www.usa-sika.com](http://www.usa-sika.com).
  - C. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multicomponent; not expected to withstand continuous water immersion or traffic.
    - 1. Movement Capability: Plus and minus 25 percent, minimum.
    - 2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
    - 3. Color: To be selected by Professional from manufacturer's standard range.
    - 4. Service Temperature Range: Minus 40 to 180 degrees F.
    - 5. Products:
      - a. Pecora Corporation; DynaTrol I-XL General Purpose One Part Polyurethane Sealant: [www.pecora.com](http://www.pecora.com).
      - b. Sika Corporation; Sikaflex-1a: [www.usa-sika.com](http://www.usa-sika.com).
      - c. R. MEADOWS, Inc.; POURTHANE NS: [www.wrmeadows.com](http://www.wrmeadows.com).
  - D. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
    - 1. Color: To be selected by Professional from manufacturer's standard range.
    - 2. Grade: ASTM C834; Grade - Minus 18 Degrees C.
    - 3. Products:
      - a. Pecora Corporation; AC-20 + Silicone Acrylic Latex Caulking Compound: [www.pecora.com](http://www.pecora.com).
  - E. Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag; not expected to withstand continuous water immersion or traffic.
    - 1. Hardness Range: 10 to 30, Shore A, when tested in accordance with ASTM C661.
    - 2. Color: To be selected by Professional from manufacturer's standard range.
    - 3. Service Temperature Range: Minus 13 to 180 degrees F.
  - F. Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag,
    - 1. non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.

## 2.5 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
    - 1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
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2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
  3. Open Cell: 40 to 50 percent larger in diameter than joint width.
  4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
1. Primers: Type recommended by sealant manufacturer to suit application; non-staining. PART 3 EXECUTION

## **2.6 EXAMINATION**

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

## **2.7 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

## **2.8 INSTALLATION**

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
  - B. Perform installation in accordance with ASTM C1193.
  - C. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
    1. Width/depth ratio of 2:1.
    2. Neck dimension no greater than 1/3 of the joint width.
    3. Surface bond area on each side not less than 75 percent of joint width.
  - D. Install bond breaker backing tape where backer rod cannot be used.
  - E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
  - F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
  - G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
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H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

**END OF SECTION**

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**SECTION 09 90 00**  
**PAINTING AND COATING**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Surface preparation.
- B. Exterior painting and coating systems.
- C. Scope:
  - 1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
    - a. Exterior: Where indicated on drawings, contractor to verify existing materials.
      - 1) Metal: Aluminum, galvanized.
      - 2) Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal and galvanized metal.

**1.2 RELATED REQUIREMENTS**

- A. Section 05 50 00 - Miscellaneous Metals.

**1.3 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. SSPC-SP 1 - Solvent Cleaning; 2015.
- C. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- D. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).
- E. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
- F. SSPC-SP 13 - Surface Preparation of Concrete; (Reaffirmed 2015); 2003.

**1.4 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
  - 1. Product characteristics.
  - 2. Surface preparation instructions and recommendations.
  - 3. Primer requirements and finish specification.
  - 4. Storage and handling requirements and recommendations.
  - 5. Application methods.
  - 6. Clean-up information.
- C. Samples: Submit four paper draw down samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Applicator's qualification statement.
- F. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, safety data sheets (SDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 60 00 - Product Requirements for additional provisions.
  - 2. Extra Paint and Finish Materials: 1 gallons of each color; from the same product run, store where directed.
  - 3. Label each container with color in addition to manufacturer's label.

#### **1.5 QUALITY ASSURANCE**

- A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.
- C. Paint Materials: Store at a minimum of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
- D. Handling: Maintain a clean, dry storage area to prevent contamination or damage to materials.

#### **1.7 FIELD CONDITIONS**

- A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.
- B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

### **PART 2 PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).
- B. Comparable Products: Products of approved manufacturers will be considered in accordance with 01 60 00 - Product Requirements, and the following:
  - 1. Products are approved by manufacturer in writing for application specified.
  - 2. Products that meet or exceed performance and physical characteristics of basis of design products.
  - 3. Other Acceptable Manufacturers:
    - a. Glidden Professional.

#### **2.2 PAINTINGS AND COATINGS**

- A. General:
  - 1. Provide factory-mixed coatings unless otherwise indicated.
  - 2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.
- B. Volatile Organic Compound (VOC) Content:
  - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:

- a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
- C. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

## **2.3 PAINT SYSTEMS - EXTERIOR**

- A. Metal: Aluminum, galvanized.
  - 1. Latex Systems:
    - a. Semi-Gloss Finish:
      - 1) 1st and 2nd Coats: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - (a) 2 to 4 mils dry per coat.
    - b. Satin Finish:
      - 1) 1st and 2nd Coats: Sherwin-Williams Pro Industrial Acrylic Eg-Shel, B66-660 Series: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - (a) 2 to 4 mils dry per coat.
- B. Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal.
  - 1. Hybrid High Performance Systems:
    - a. Semi-Gloss Finish:
      - 1) 1st Coat: Sherwin-Williams Protective & Marine Coatings Polyamide Epoxy, Macropoxy 646 Fast Cure Epoxy : [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - (a) 7 to 13.5 mils wet, 5 to 10 mils dry per coat.
      - 2) 2nd and 3rd Coat: Sherwin-Williams Protective & Marine Coatings Two Component Aliphatic, Acrylic Polyurethane Resin, Hi-Solids Polyurethane 250 Aliphatic Polyurethane. [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - (a) to 8 mils wet per coat, 3 to 5 mils dry per coat.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

### **3.2 PREPARATION**

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove mildew from impervious surfaces by scrubbing with solution of water and bleach. Rinse with clean water and allow surface to dry.
- D. Aluminum: Remove surface contamination and oil; wash with solvent according to SSPC-SP 1.
- E. Galvanized Surfaces:
  - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
  - 2. Prepare surface according to SSPC-SP 2.
- F. Ferrous Metal:



1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning according to SSPC-SP 6. Protect from corrosion until coated.

### **3.3 APPLICATION**

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions.
- C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.
- D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

### **3.4 PRIMING**

- A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.
- B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

### **3.5 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

### **3.6 PROTECTION**

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

**END OF SECTION**

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**SECTION 22 10 06**  
**PLUMBING PIPING SPECIALTIES****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Roof drains.

**1.2 RELATED REQUIREMENTS**

- A. Division 07 53 00 - Elastomeric Membrane Roofing.

**1.3 REFERENCE STANDARDS**

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ASME A112.6.4 - Roof, Deck, and Balcony Drains; 2003.

**1.4 SUBMITTALS**

- A. See Section 013300 - Submittal Procedures.
- B. Listed manufacturers and series are for reference only and do not promote any single product. Series are provided for reference, and should not be used as an ordering model number. Accessories and options may be custom components purchased separately.
- C. Product Data: Provide manufacturer's most current catalog data sheet for equipment indicating rough-in size, finish, and accessories. Manufacturer's data sheets on each item of equipment and device, shall be clearly marked up to identify the items, accessories and options to be used on the project.
  - 1. Provide component sizes, rough-in requirements, service sizes, and finishes. Indicate dimensions, weights, and placement of openings and holes.
  - 2. Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.
  - 3. Roof Drains. (22 10 06 - 001 -A)
- D. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, water hammer arrestors.
  - 1. Refer to Section 017700 - Closeout Submittals.
  - 2. (20 00 00 - 005 - A)
- E. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
  - 1. Refer to Section 017700 - Closeout Submittals.
  - 2. (20 00 00 - 006 - A)
  - 3. (20 00 00 - 007 - A)
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 016000 - Product Requirements, for additional provisions.
  - 2. 2 additional dome covers for each type of roof drain.

**PART 2 PRODUCTS****2.1 ROOF DRAINS**

- A. Roof Drains:
    - 1. Assembly: ASME A112.6.4.
    - 2. Body: Lacquered cast iron with sump with deck clamp.
-

3. Strainer: Removable polyethylene dome with vandal proof screws.
4. Accessories: Coordinate with roofing type, refer to Division 07:
  - a. Under deck clamp.
  - b. Drain receiver.
5. Size: To match existing drain indicated to be replaced, field verify.
6. Manufacturers:
  - a. Jay R. Smith Manufacturing Company; Series 1015: [www.jrsmith.com/#sle](http://www.jrsmith.com/#sle).
  - b. OMG Roofing Products: [www.omgroofing.com/#sle](http://www.omgroofing.com/#sle).

### **PART 3 EXECUTION**

#### **3.1 INSTALLATION**

- A. Install in accordance with the following:
  1. Federal, State and Local Codes.
  2. 36 CFR 1191
  3. NSF 61
- B. Roof Drains:
  1. Install roof drain within roofing system. Refer to Division 075300 - Elastomeric Membrane Roofing for roof systems.

**END OF SECTION**

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**SECTION 22 14 26**  
**RETROFIT ROOF DRAINS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Retrofit roof drains.

**1.2 RELATED REQUIREMENTS**

- A. Section 07 53 00 – Elastomeric Membrane Roofing.

**1.3 REFERENCE STANDARDS**

- A. International Association of Plumbing and Mechanical Officials (IAPMO):
- B. PS 97-96 – Mechanical Cast Iron Closet Flanges – Pressure Test
- C. Single Ply Roofing Industry (SPRI):
- D. ANSI/SPRI RD-1 – Performance Standard for Retrofit Drains.

**1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's product data, including installation instructions.
- B. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating dimensions, materials, hardware, and installation layout including sizes and spacing.
- C. Samples: Submit manufacturer's sample of retrofit roof drains.
- D. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- E. Warranty Documentation: Submit manufacturer's standard warranty.

**1.5 QUALITY ASSURANCE**

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for past 5 years, in manufacture of retrofit roof drains of similar type to that specified.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
  - 1. Store and handle materials in accordance with manufacturer's instructions.
  - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
  - 3. Store materials in clean, dry area indoors.
  - 4. Protect materials during storage, handling, and installation to prevent damage.

**PART2 PRODUCTS****2.1 MANUFACTURER**

- A. Basis of Design - Retrofit Drains: RAC Deluxe Retrofit Drain by OMG, Inc.; [www.olyfast.com](http://www.olyfast.com) or comparable product meeting project requirements.

**2.2 RETROFIT ROOF DRAINS**

- A. Retrofit Roof Drains: "RAC Deluxe RetroDrain".
-

1. Size: 3 inches to 6 inches to be field verified.
2. Compliance:
  - a. ANSI/SPRI RD-1.
  - b. IAPMO PS 97-96.
3. Drain Body:
  - a. Material: 0.080-inch aluminum.
  - b. Flange: 18-inch square.
  - c. Drain Stem Length: To be field verified.
  - d. Flange Includes:
    - 1) Six 1-1/8-inch-long stainless steel studs.
    - 2) 12 pre-punched holes to secure flange.
  - e. Sump Area: Depressed.
4. Strainer Dome:
  - a. Material: 0.080-inch aluminum.
  - b. Height: 4 inches.
  - c. Outside Base Diameter: 14 inches.
  - d. Inlet Area: 125 square inches.
5. Clamping Ring:
  - a. Material: 0.125-inch aluminum.
  - b. Low profile.
  - c. Strainer Brackets: 2, to 5-1/2 inches high to secure strainer.
  - d. Bosses: 6, to accept studs on flange.
6. Backflow Seal:
  - a. Compression Seal: Watertight, "RAC Seal" mechanical seal.
  - b. Material: Urethane and cast aluminum.
  - c. Required for Activation: 7/16-inch wrench.
7. Hardware:
  - a. Nuts: 6, stainless steel kep nuts, for studs.

### **2.3 ACCESSORIES**

- A. Drain Guard: "DrainGuard".
  1. [3-foot by 3-foot] [4-foot by 4-foot] aluminum fixture, 4-inches high with drainage slots.
  2. Adhere to roof system.
  3. Surround retrofit roof drains to prevent blockage of drain strainer. EXECUTION

## **PART 3 EXAMINATION**

### **3.1 EXAMINATION**

- A. Examine existing roof drains to receive retrofit roof drains.
- B. Notify Architect of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

### **3.2 PREPARATION**

- A. Remove clamping ring, strainer dome, and bolts from existing roof drain assembly and discard.
- B. Clean existing drain leader pipe of bitumen, dirt, and debris.

**3.3 INSTALLATION**

- A. Install retrofit roof drains in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install retrofit roof drains into existing drain leaders in accordance with manufacturer's instructions.
- C. Install flashing in accordance with membrane roofing manufacturer's instructions.
- D. Install retrofit roof drains to provide watertight connection to existing plumbing and membrane roofing systems.

**3.4 PROTECTION**

- A. Protect installed retrofit roof drains to ensure that, except for normal weathering, retrofit roof drains will be without damage or deterioration at time of Substantial Completion.

**END OF SECTION**



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